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Bieser

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(54) **MOBILE SECURITY SYSTEM AND METHOD**

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(22) Filed: **Oct. 5, 2015**

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(51) **Int. Cl.**

G08B 1/08	(2006.01)
G08B 25/10	(2006.01)
G08B 19/00	(2006.01)

(52) **U.S. Cl.**

CPC ***G08B 25/10*** (2013.01); ***G08B 19/00*** (2013.01)

(58) **Field of Classification Search**

CPC G08B 25/10; G08B 19/00; G08B 21/02; G08B 21/0202; G08B 21/0227; G08B 21/0258; G08B 21/0266; G08B 21/24

See application file for complete search history.

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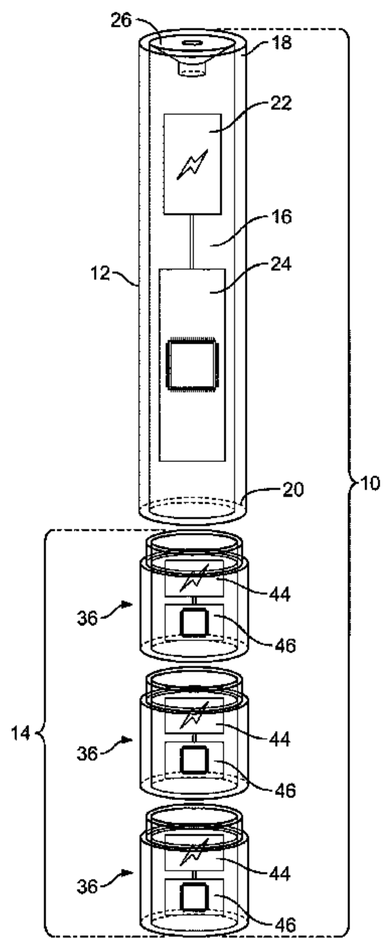
(57) **ABSTRACT**

Embodiments relate to a mobile security device, system and method. The mobile security device includes a base and at least one sensor. The base has a housing defining a first end and a second end. The base includes a base power source and a base controller coupled to the base power source and configured for wireless communication. The at least one sensor is removably coupled to the first end of the base and communicates therewith. The at least one sensor is configured to provide at least one of motion sensing, CO2/smoke sensing, vibration sensing, light sensing, and temperature/humidity sensing. The at least one sensor includes a sensor housing; a sensor power source; and a sensor controller coupled to the sensor power source and configured for wireless communication.

32 Claims, 11 Drawing Sheets



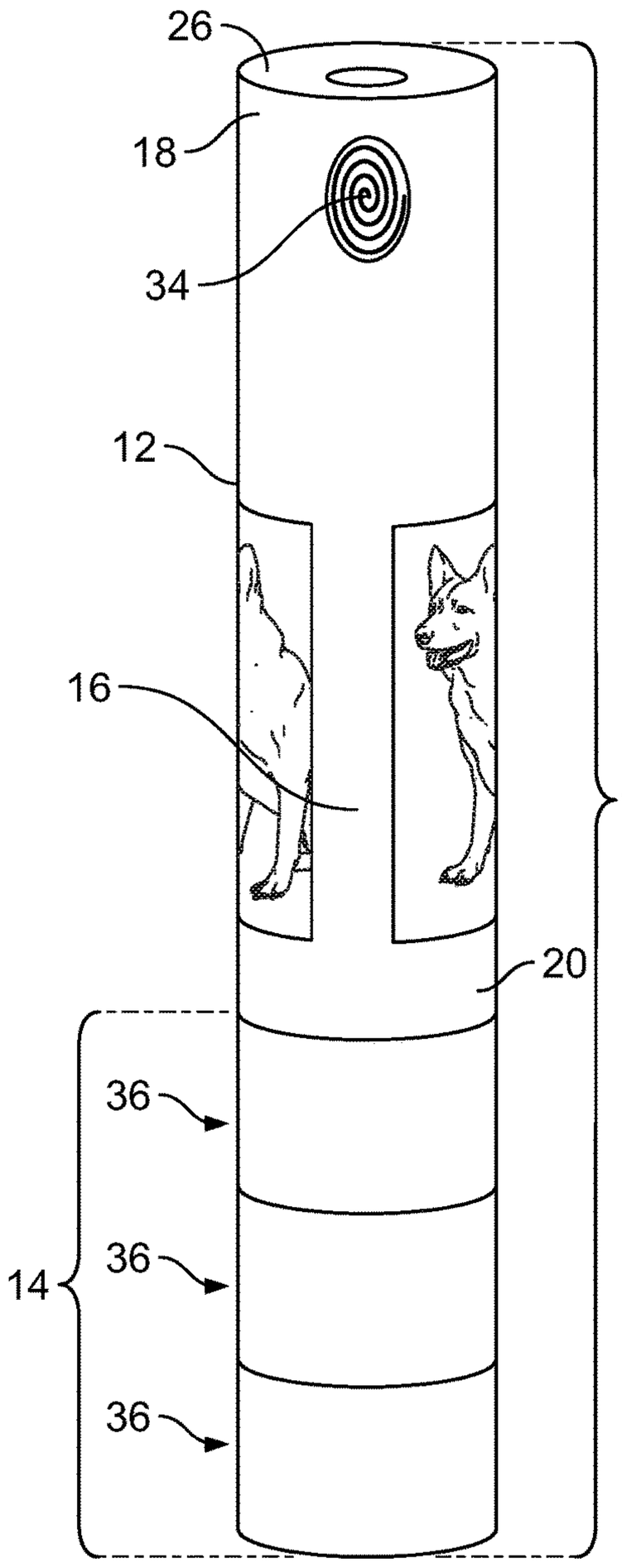


FIG. 1

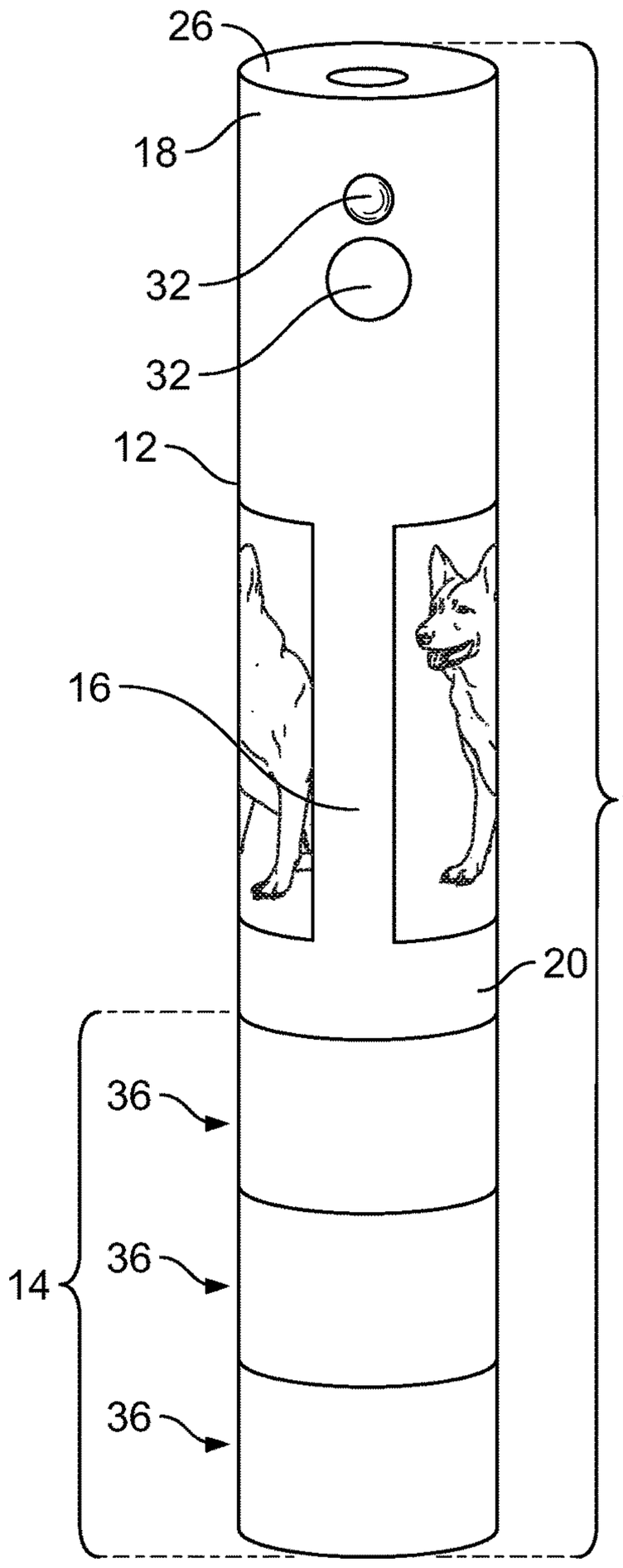


FIG. 2

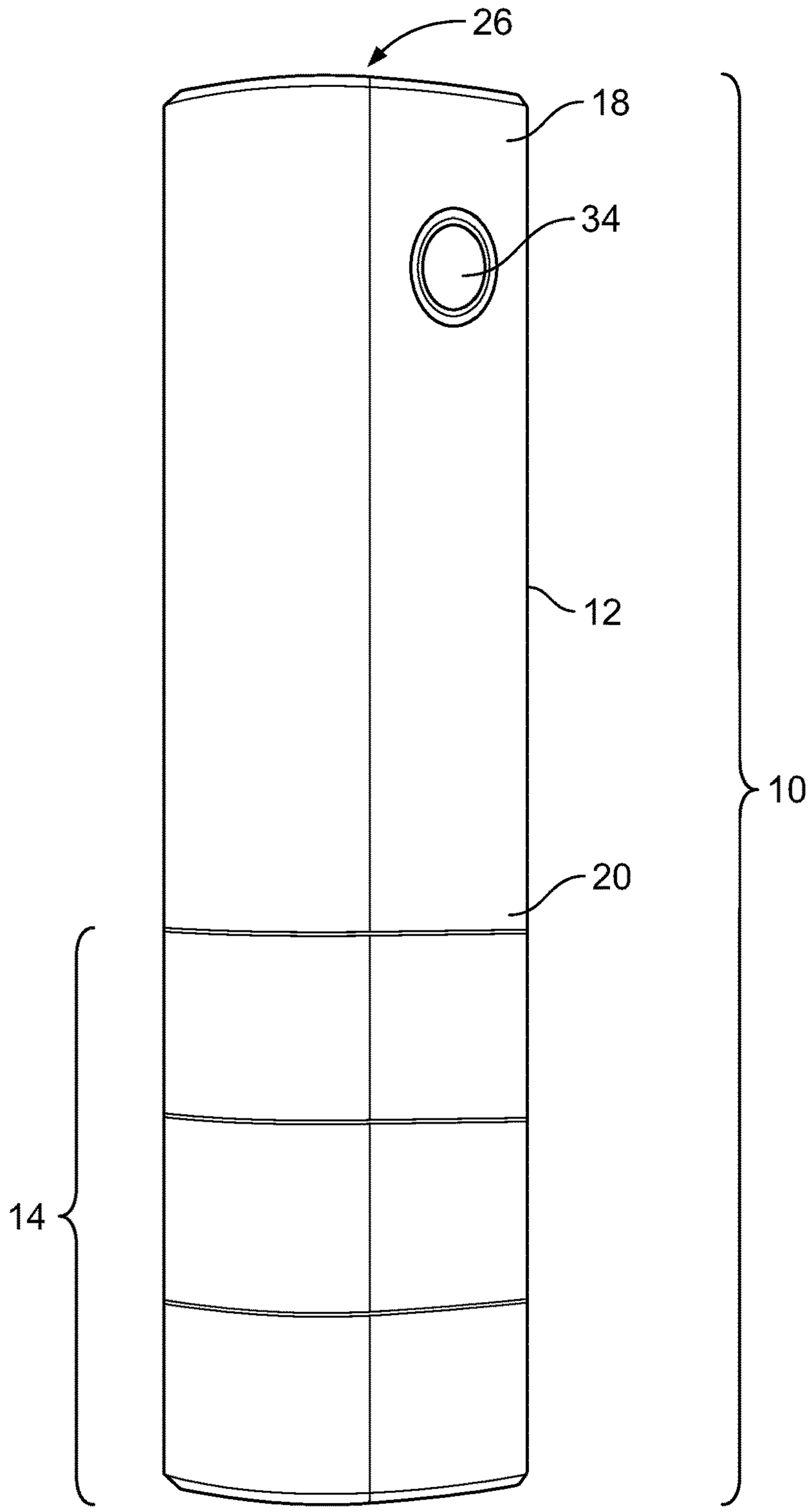


FIG. 3

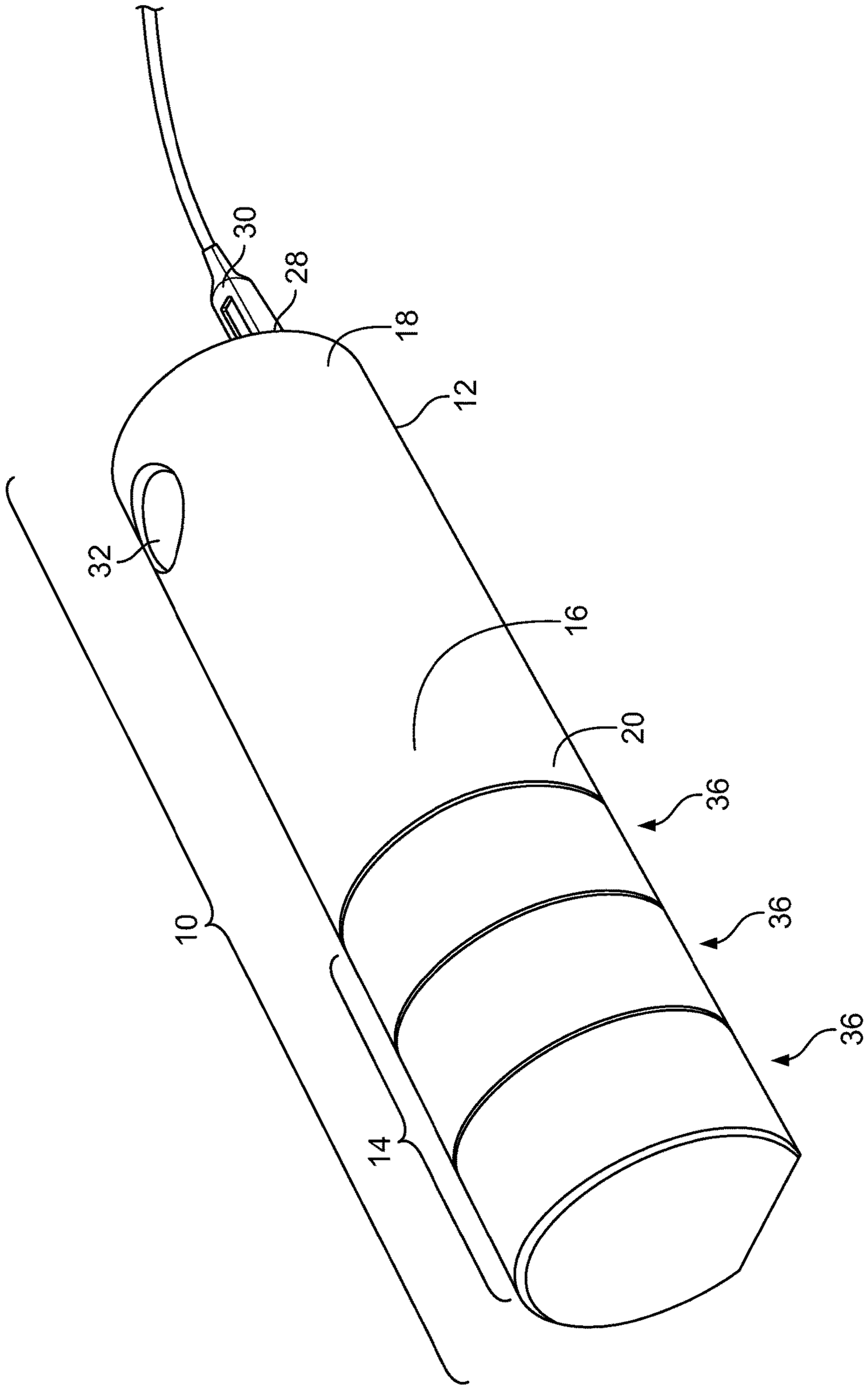


FIG. 4

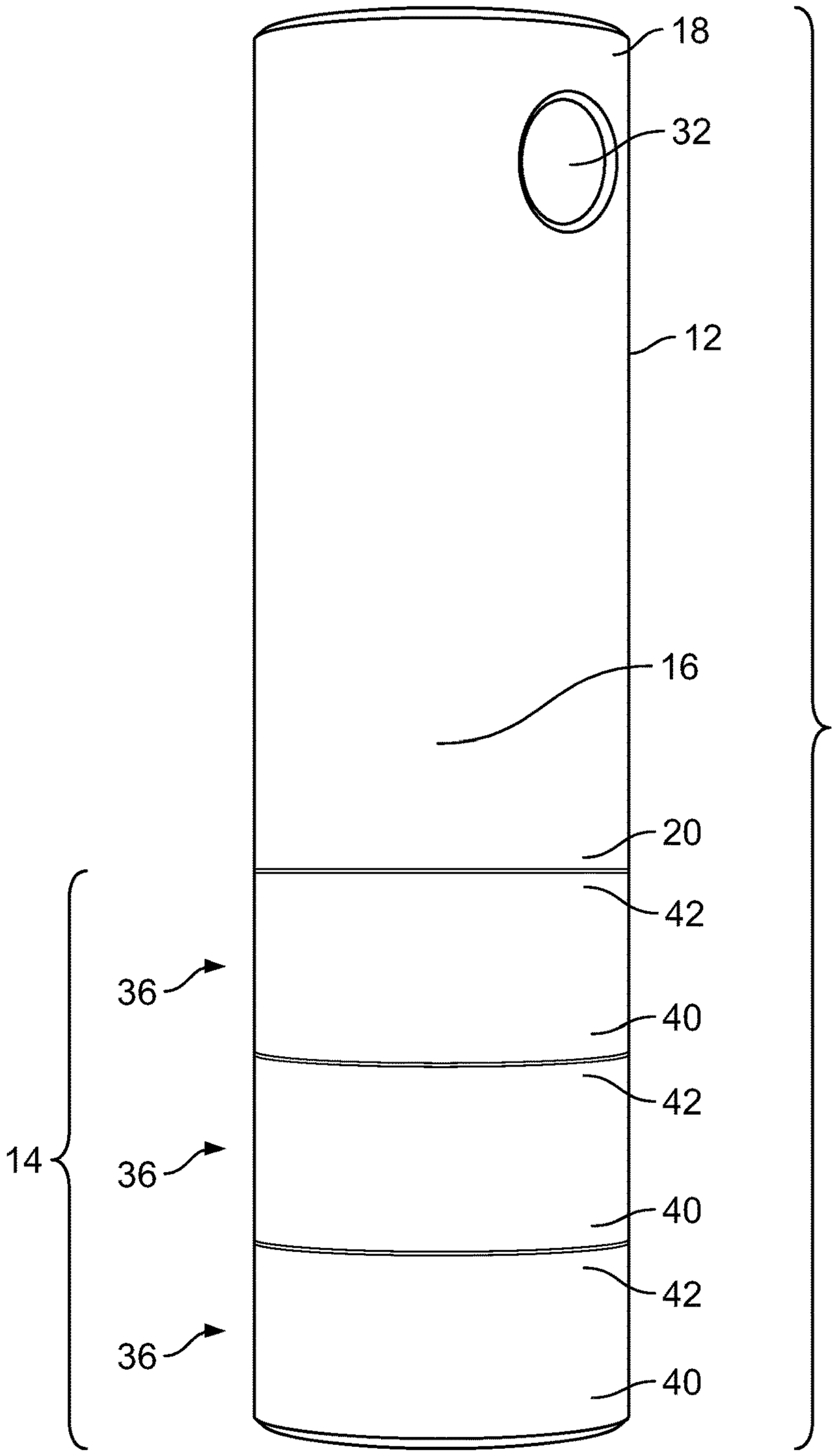


FIG. 5

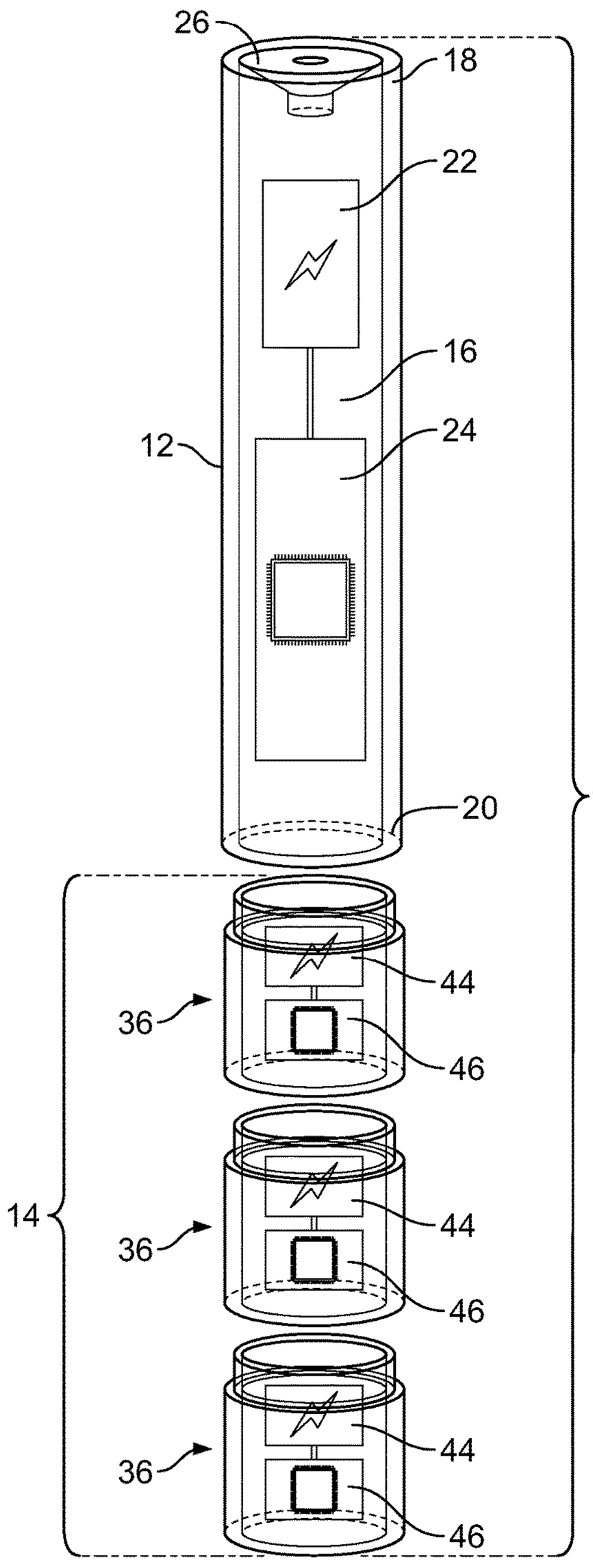


FIG. 6

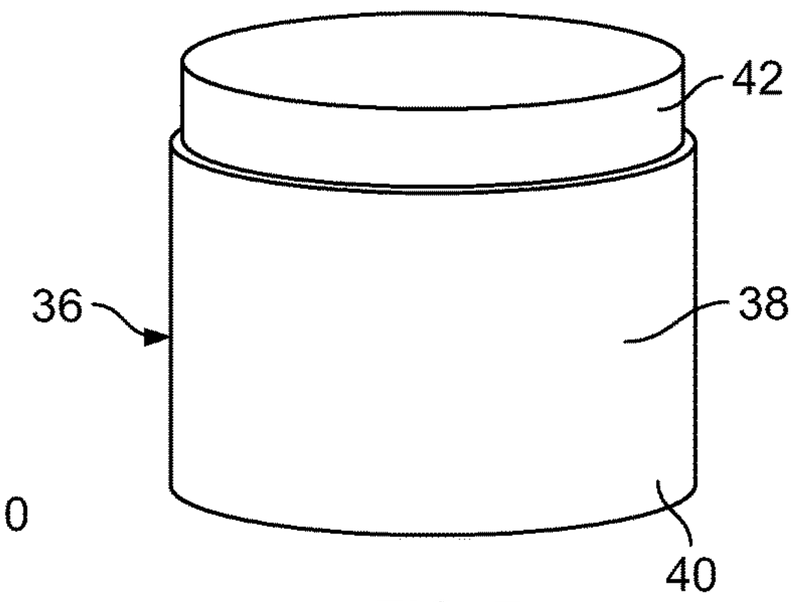


FIG. 7

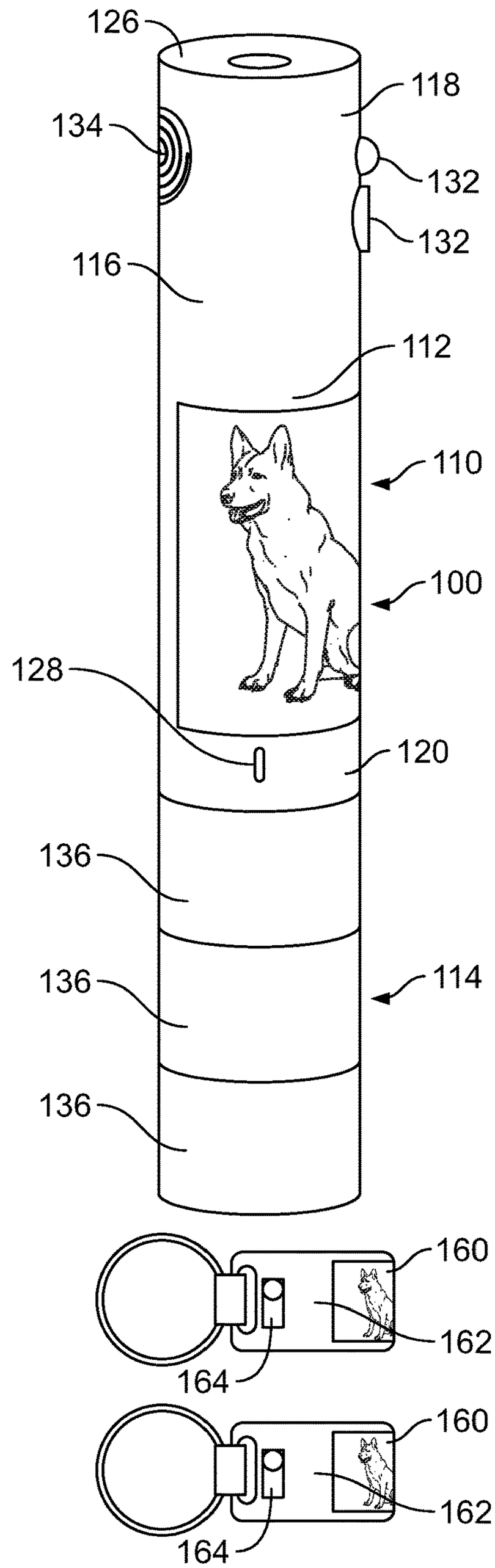

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FIG. 8A

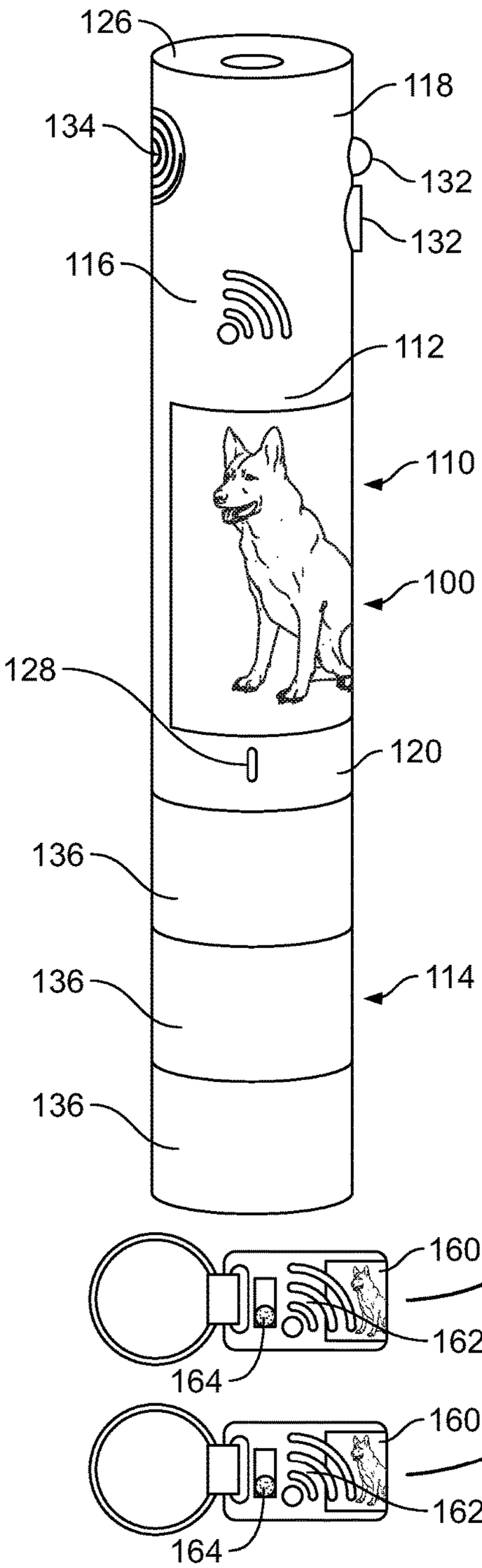
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FIG. 8B

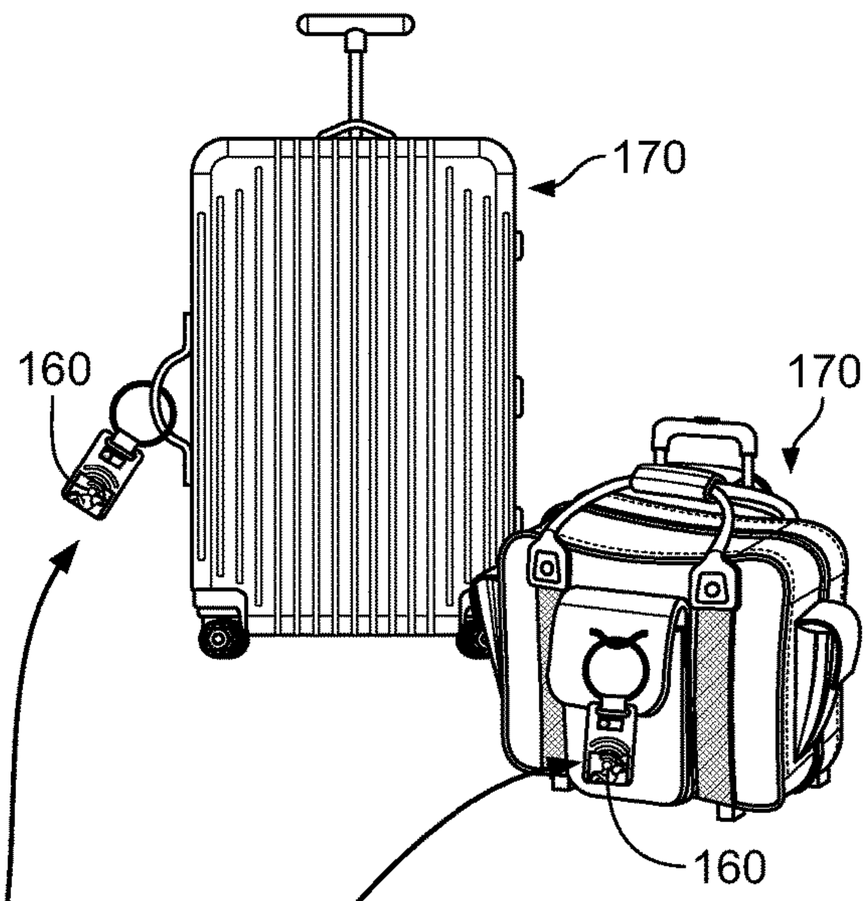
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FIG. 8C

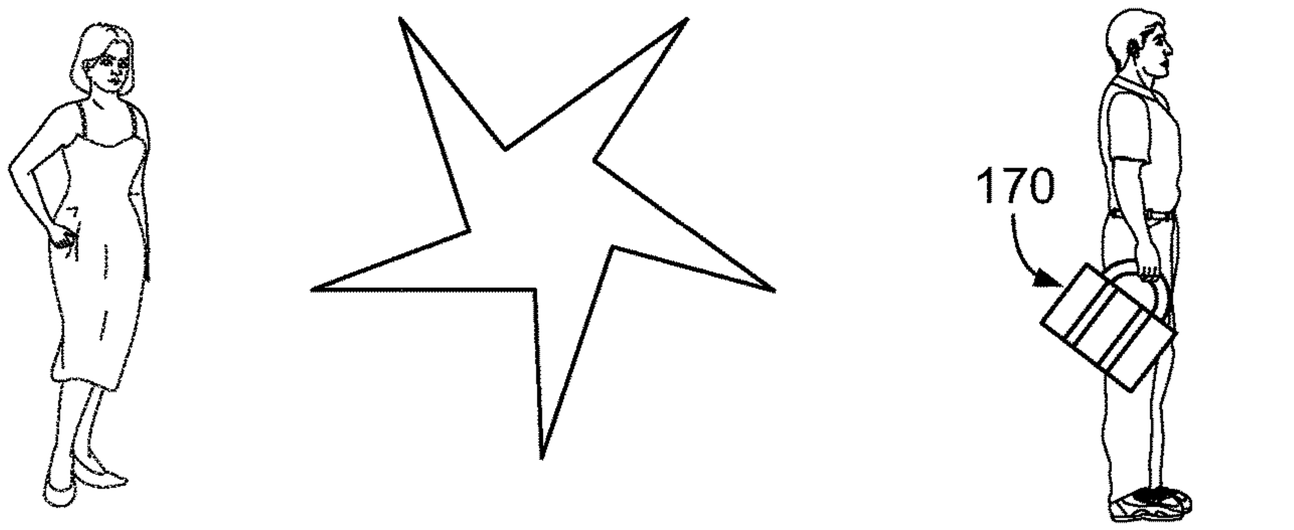

FIG. 8D

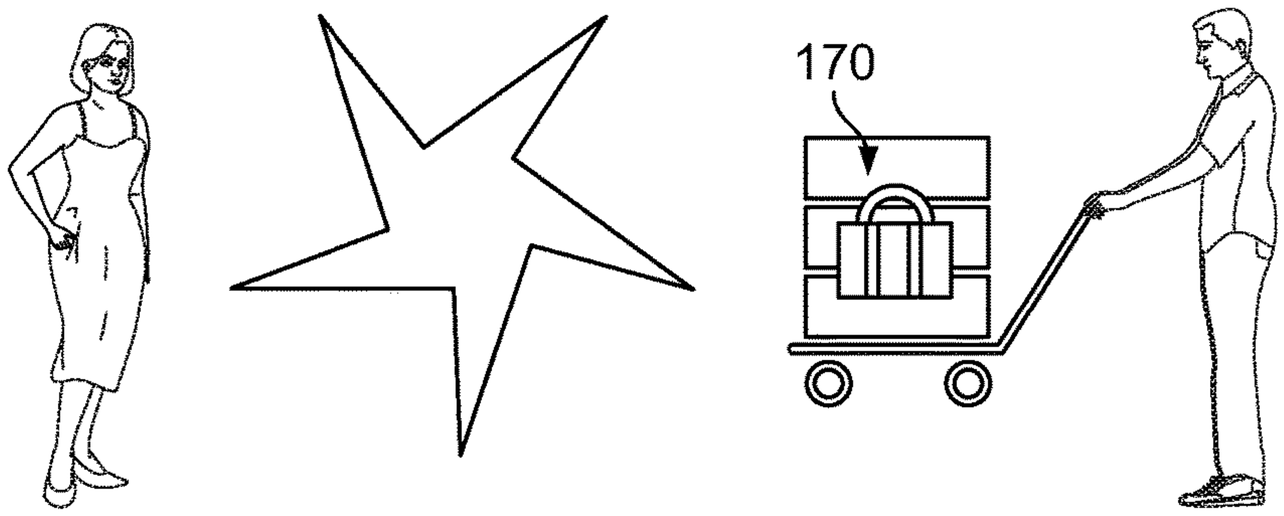

FIG. 8E

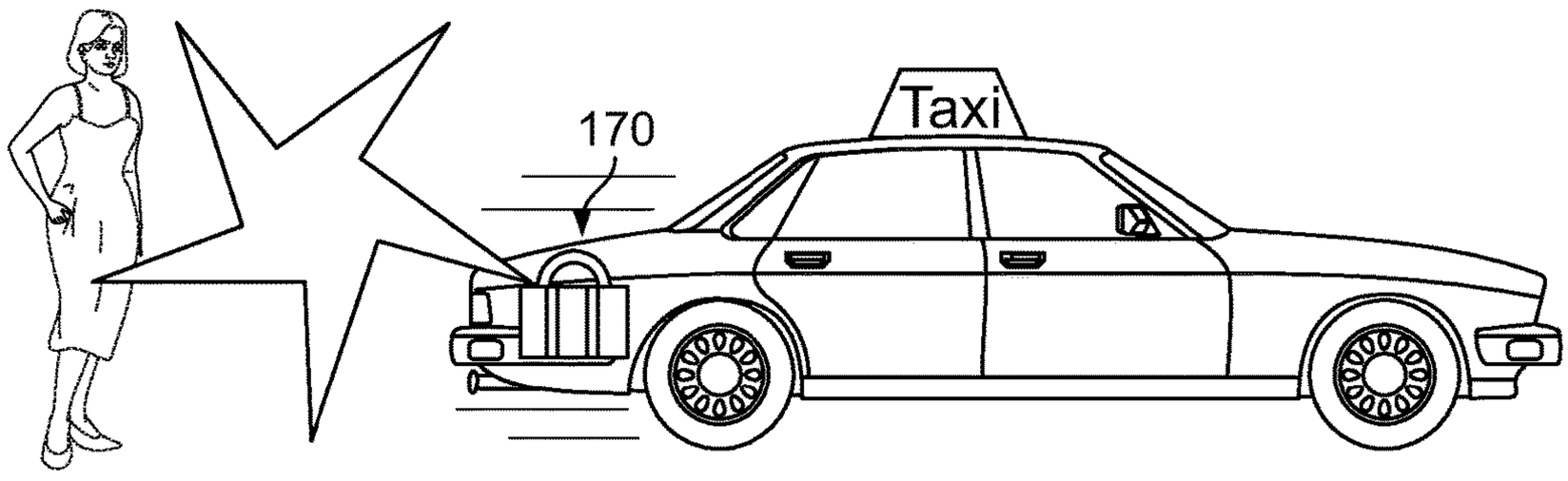

FIG. 8F

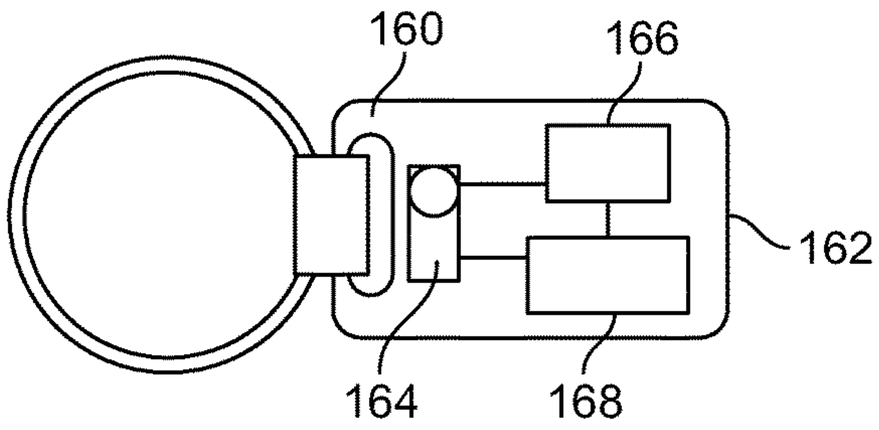
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FIG. 9

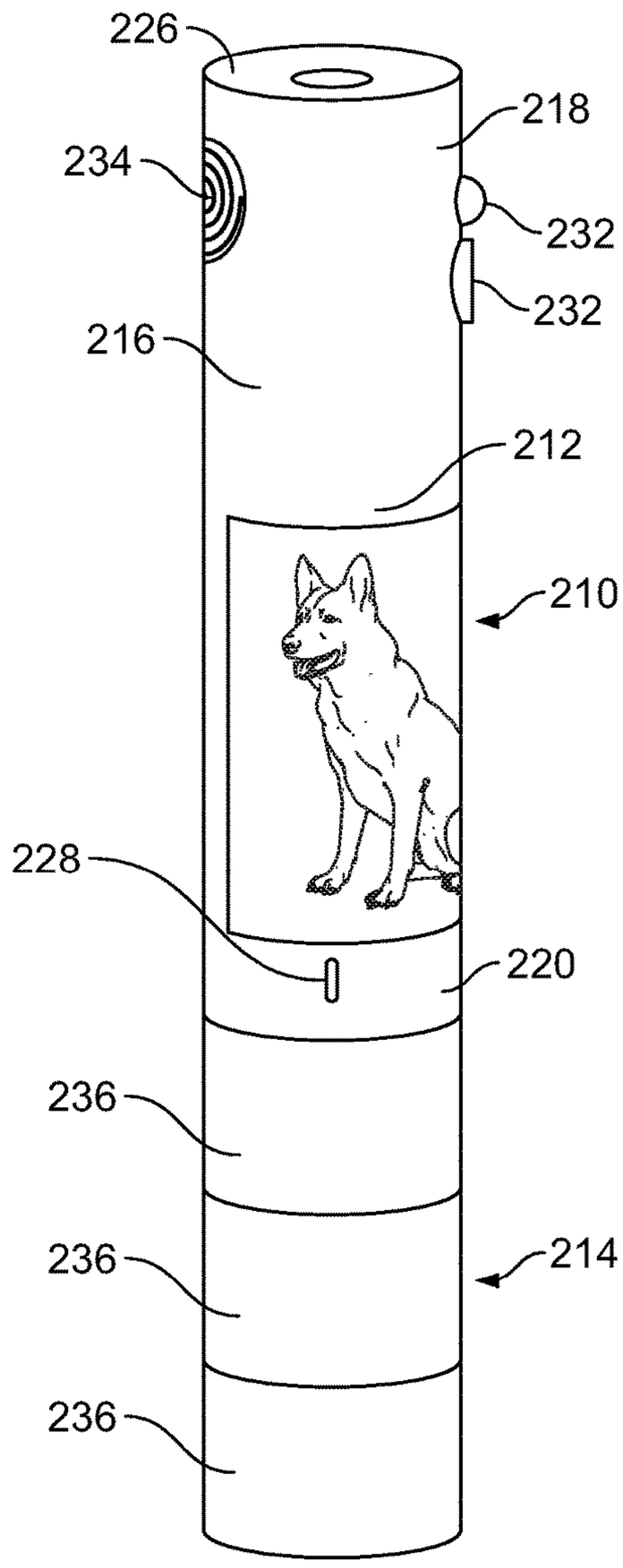
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FIG. 10A

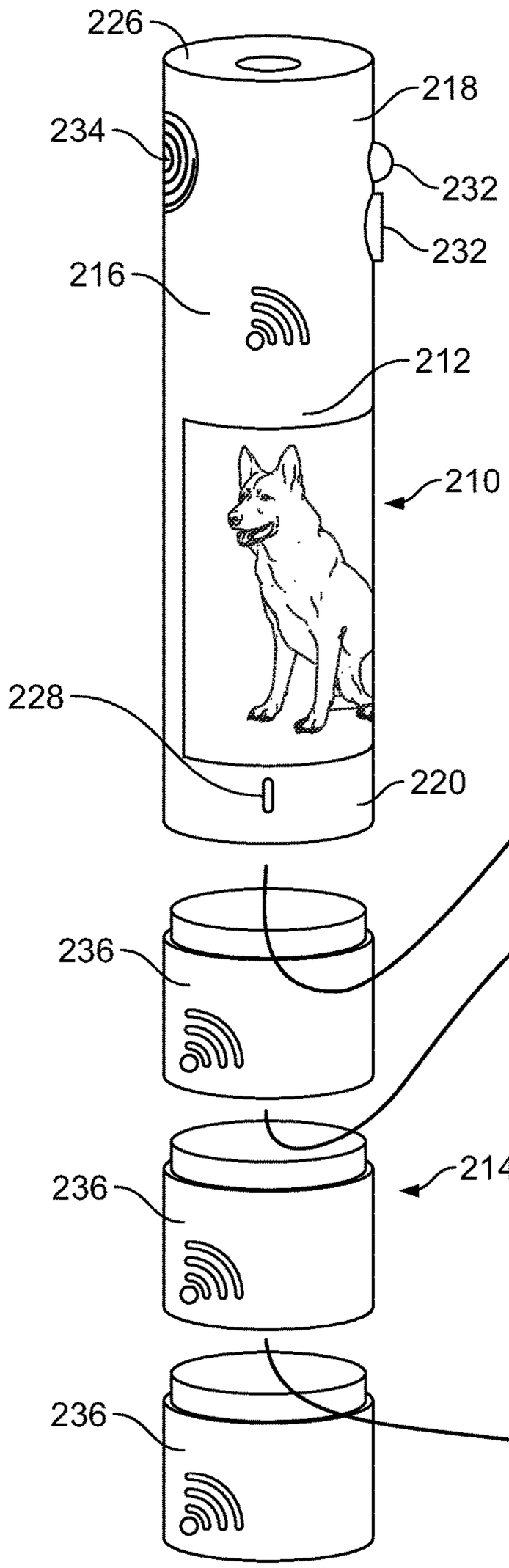

FIG. 10B

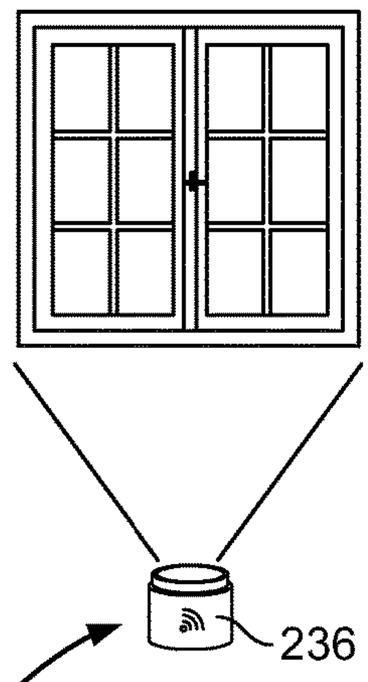

FIG. 10C

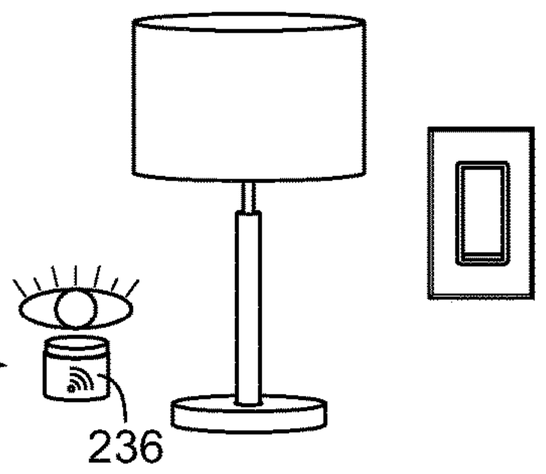

FIG. 10D

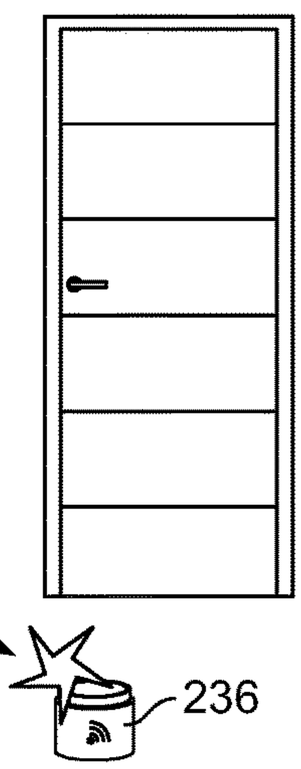

FIG. 10E

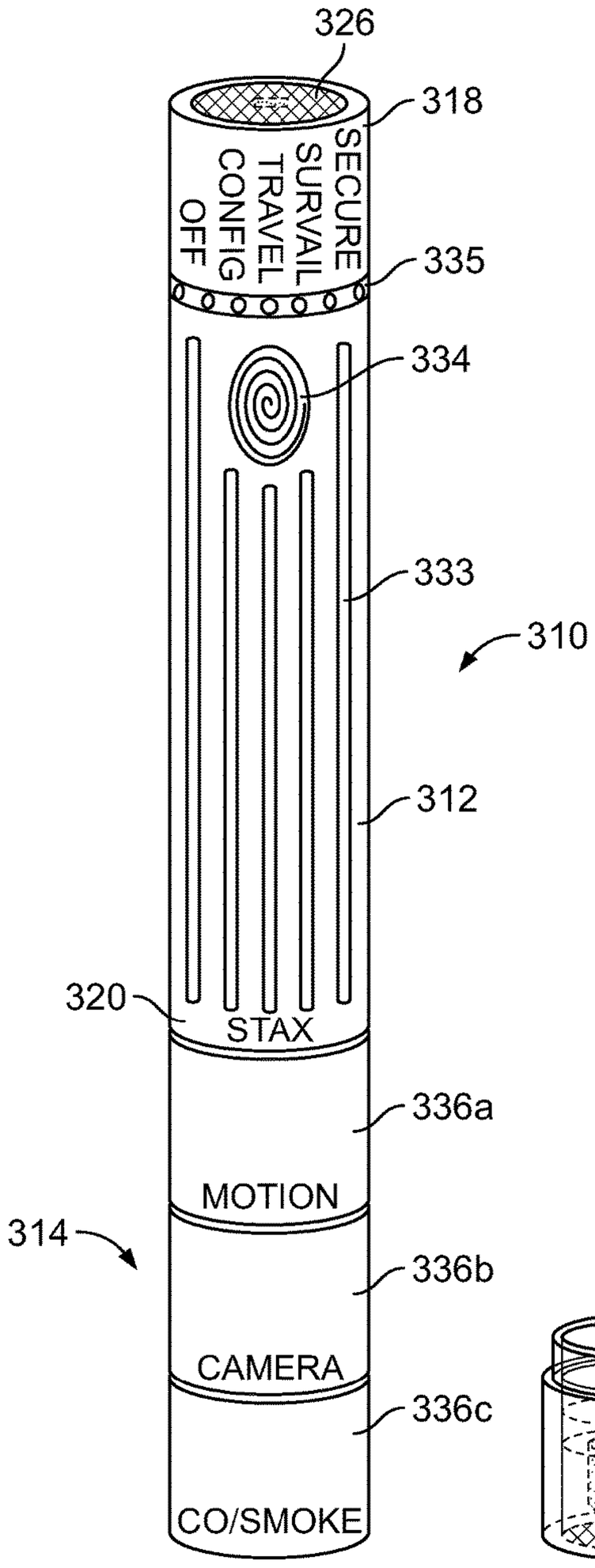

FIG. 11

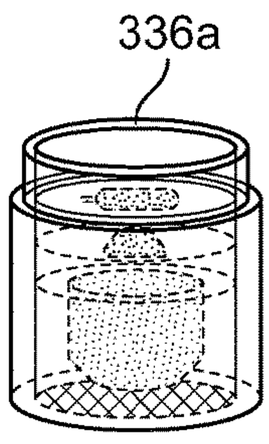

FIG. 12a

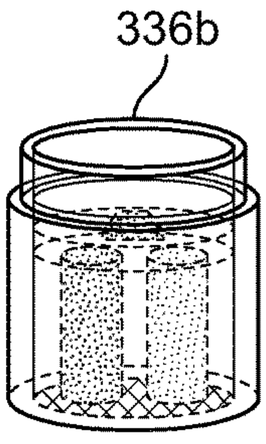

FIG. 12b

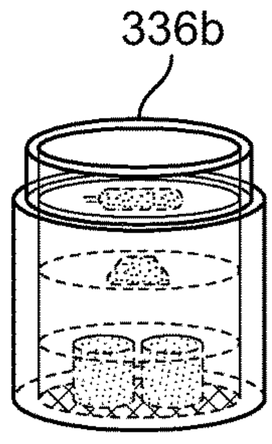

FIG. 12c

MOBILE SECURITY SYSTEM AND METHOD

CLAIM FOR PRIORITY

This application claims priority from U.S. Provisional Application Ser. No. 62/059,944 filed Oct. 5, 2014, the complete subject matter of which is incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

The invention relates generally to a security device. More specifically, the present invention relates to a portable, mobile security device, system and method.

BACKGROUND OF THE INVENTION

Embodiments of the present invention relate to security. Few human needs are as fundamental and timeless as personal safety and security . . . and few have been more explosively changed by the proliferation of smart phones and the recent realization of device "connectedness" technologies. Witness the rise of remote access keyless locks, Internet-ready multi-sensor security systems, and even "smart home" automation and awareness hubs . . . it's an old itch with a new scratch.

But these advances are centered around the home and people are not . . . people are in motion . . . people travel . . . and whether to a local office or a distant city, whether on business or on pleasure, whether for just the day or many weeks, risk travels with them . . . risk of theft in-transit, risk of intrusion on-site, risk of undetected catastrophe . . . and far from the security of home.

For the foregoing reasons, it would be desirable to provide a mobile device, system and method that is easy to use. It would be desirable to provide a fully self-contained, compact, multi-sensor security system designed specifically for security on the move. It would be even more desirable to provide supplemental awareness of specific security risks (motion, smoke/CO, sound, light, and the like and inform the user via ALERTs (text/e-mail), ALARMs (audio), both or through some other means.

SUMMARY OF THE INVENTION

Embodiments relate to a fully self-contained, compact, multi-sensor security system designed specifically for security on the move. The base can stand alone, providing motion detection, visuals via an optional camera, and in-transit monitoring of belongings. If a security event occurs, the system informs the user via ALERTs (text/e-mail), ALARMs (audio), both or through some other means. For more comprehensive protection, add one or more tiny wireless sensors, each sensor providing supplemental awareness of specific security risks (motion, smoke/CO, sound, light, and the like). The base monitors these elements, reporting immediately when security issues occur. When not in use, these elements lock onto the base for travel convenience and charge their batteries from the base power source.

Embodiments relate to a mobile security device, system and method. The device includes a base and at least one sensor. The base has a housing defining a first end and a second end. The base includes a base power source and a base controller coupled to the base power source and configured for wireless communication. The at least one sensor is removably coupled to the first end of the base and communicates therewith. The at least one sensor is configured to provide at least one of motion sensing, CO2/smoke sensing, vibration sensing, light sensing, and temperature/humidity sensing. The at least one sensor includes a sensor housing; a sensor power source; and a sensor controller coupled to the sensor power source and configured for wireless communication.

Another embodiment relates to a mobile security system including a base, first, second and third sensors, and first and second proximity tags. The base has a housing defining a first end and a second end, and includes a base power source; a base controller coupled to the power source and configured for wireless communication; a speaker coupled to at least one of the base power source and the base controller; and a camera coupled to at least one of the base power source and the base controller. The first sensor is removably coupled to the first end of the base and communicates therewith, the first sensor is configured to provide at least one of motion sensing, CO2/smoke sensing, vibration sensing, light sensing, and temperature/humidity sensing, where the first sensor includes a first sensor housing; a first sensor power source; and a first sensor controller coupled to the first sensor power source and configured for wireless communication. The second sensor is removably coupled proximate the first end of the base and communicates therewith, the second sensor is configured to provide at least one of motion sensing, CO2/smoke sensing, vibration sensing, light sensing, and temperature/humidity sensing, the second sensor including a second sensor housing; a second sensor power source; and a second sensor controller coupled to the power source and configured for wireless communication. The third sensor is removably coupled proximate the first end of the base and communicates therewith, the third sensor is configured to provide at least one of motion sensing, CO2/smoke sensing, vibration sensing, light sensing, and temperature/humidity sensing, the third sensor including a third sensor housing; a third sensor power source; and a third sensor controller coupled to the third sensor power source and configured for wireless communication. The first proximity tag is adapted to attach to a bag and/or belongings and communicates with at least the base, the first proximity tag configured to provide approximate distance-from-base information, the first proximity tag including a first proximity tag housing; a first proximity tag power source; and a first proximity tag controller coupled to the first proximity tag power source and configured for wireless communication. The second proximity tag is adapted to attach to a bag and/or belongings and communicates with at least the base, the second proximity tag configured to provide approximate distance-from-base information, the second proximity tag includes a second proximity tag housing; a second proximity tag power source; and a second proximity tag controller coupled to the second proximity tag power source and configured for wireless communication.

Yet another embodiment relates to a method for providing security using a mobile security device, the mobile security device including a base and at least one proximity tag. The base has a housing defining a first end and a second end, and includes a base power source; a base controller coupled to the base power source and configured for wireless communication; a speaker coupled to at least one of the base power source and the base controller; a camera coupled to at least one of the base power source and the base controller; and a touch pad coupled to at least one of the base power source and the base controller. The at least one proximity tag is configured to attach to a bag and/or belongings and communicate with the base. The at least one proximity tag is

configured to provide approximate distance-from-base information, the at least one proximity tag including a proximity tag housing; a proximity tag power source; a proximity tag controller coupled to the proximity tag power source and configured for wireless communication. The method includes independently powering-up the at least one proximity tag; placing the at least one proximity tag on a bag and/or belongings; initiating proximity monitoring from the base; arming the base and the at least one proximity tag; monitoring the at least one proximity tag for proximity states; and base ALARMing and ALERTing when changes in proximity state of the at least one proximity tag occur.

Still another embodiment relates to a method for providing security using a mobile security device. The mobile security device includes a base and a sensor. The base has a housing defining a first end and a second end, and includes a base power source; a base controller coupled to the base power source and configured for wireless communication; a speaker coupled to at least one of the base power source and the base controller; a camera coupled to at least one of the base power source and the base controller; and a touch pad coupled to at least one of the base power source and the base controller. The at least one sensor is removably coupled to the first end of the base and communicates therewith, the at least one sensor configured to provide at least one of motion sensing, CO2/smoke sensing, vibration sensing, light sensing, and temperature/humidity sensing. The at least one sensor includes a sensor housing; a sensor power source; and a sensor controller coupled to the sensor power source and configured for wireless communication. The method includes detaching the at least one sensor auto-activating the sensor; positioning the at least one sensor to at least one risk point in a security zone; initiating at least one of watch-only and watch-and-warn sensor monitoring from the base; arming the base and the at least one sensor; monitoring the at least sensor for heartbeats; monitoring the at least sensor for security events; performing at least one of base ALERTing, base ALARMing and base ALERTing and ALARMing when missed heartbeats or security events occur in the at least one sensor; and disarming the base and the at least one sensor.

The foregoing and other features and advantages of the invention will become further apparent from the following detailed description of the presently preferred embodiment, read in conjunction with the accompanying drawings. The drawings are not to scale. The detailed description and drawings are merely illustrative of the invention rather than limiting, the scope of the invention being defined by the appended claims and equivalents thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a front view of the device in accordance with one embodiment of the present invention;

FIG. **2** illustrates a back view of the device of FIG. **1** in accordance with one embodiment of the present invention;

FIG. **3** illustrates a front perspective view of the device of FIG. **1** in accordance with one embodiment of the present invention;

FIG. **4** illustrates another front perspective view of the device of FIG. **1** in accordance with one embodiment of the present invention;

FIG. **5** illustrates a back perspective view of the device of FIG. **1** in accordance with one embodiment of the present invention;

FIG. **6** illustrates the internal components of the device of FIG. **1** in accordance with one embodiment of the present invention;

FIG. **7** illustrates a perspective view of the sensor of FIG. **1** in accordance with one embodiment of the present invention;

FIGS. **8**A-**8**F illustrate another embodiment of the device used in a TRAVEL mode with the a plurality of proximity tags in accordance with one embodiment of the present invention;

FIG. **9** illustrates the internal components of the proximity tags; and

FIGS. **10**A-**10**E illustrate the embodiment of the device with the sensors deployed in a SURVAIL/SECURE mode in accordance with one embodiment of the present invention.

FIG. **11** illustrates another embodiment of the device.

FIGS. **12***a*-**12***c* respectively illustrate the three sensors of the device of FIG. **11**.

Throughout the various figures, like reference numbers refer to like elements.

DETAILED DESCRIPTION OF PRESENTLY PREFERRED EMBODIMENTS

Few human needs are as fundamental and timeless as personal safety and security . . . and few needs have been more explosively changed by the proliferation of smart phones and the recent realization of device "connectedness" technologies. Witness the rise of remote access keyless locks, Internet-ready multi-sensor security systems, and even "smart home" automation and awareness hubs . . . it's an old itch with a new scratch. Embodiments of the present invention scratch that itch. Embodiments of the present invention relate to personal safety and security. More specifically embodiments of the present invention relate to a portable, mobile security system and method.

FIGS. **1-5** depict a mobile security device, generally designated **10**, in accordance with one embodiment of the present invention. In at least one embodiment, the mobile security system **10** operates in one or more modes: TRAVEL (proximity monitoring for proximity tags); SURVAIL (silent observation—ALERTs but no ALARMs); and SECURE (full "watch-and-warn" security system—ALERTs and ALARMs). The mobile security system **10** includes a rapid deploy and arm sequence (less than 30 seconds from assembled "inert" system to actively monitoring) providing personal safety and security.

The illustrated mobile security device **10** is relatively small, with a diameter of about 1.5" and an overall length of about 8.5" and able to fit in about any bag or purse. As depicted, the mobile security system **10** includes a base **12** (having a length of about 5.5") and one or more elements **14**, each element about 1" in length. FIGS. **1-5** depict the mobile security device **10** having an elongated, cylindrical-like shape, although other shapes are contemplated.

FIGS. **1-5** depict the base **12** having a housing **16** defining a second end **18** and a first end **20**. FIG. **1** depicts the mobile security device **10** having an elongated, cylindrical-like shape which minimizes "catching" on bag/contents, minimizing the risk of damage to the bag/contents, although other shapes are contemplated. Further housing **16** has an anti-slip exterior finish that resists scratches. It should be appreciated that the dimensions and exterior are illustrative only, and other sizes and dimensions are contemplated.

As depicted in FIG. **6**, the base **10** includes at least a rechargeable base power source **22** and a base controller **24** connected thereto. Base power source **22** enables extended

operation of the base **10** and elements **14** while the base controller **24** is configured for wireless communication with a wireless communication device such as a smartphone, PDA, laptop and the like. FIGS. **1** & **3** further illustrate a speaker **26** coupled to at least one or both of the base power source **22** and the base controller **24**. The mobile security device **10** further includes a jack **28** (best viewed in FIG. **4**). Jack **28** is adapted to removeably receive a USB charging cord **30** to charge the base power source **22**.

In at least one embodiment, the base **12** further includes at least one camera **32** coupled to at least one of the base power source **22** and the base controller **24**. Further, the base **12** further includes at least one touch pad **34** communicating with at least the base controller **24** to select different modes of operation.

In at least one embodiment, the one or more elements **14** comprise one or more sensors **36**. FIGS. **1-5** illustrate three sensors **36** coupled to the base **12** at or proximate first end **20**. While three sensors **36** are illustrated, more or less than three sensors **36** are contemplated. FIG. **1-5** illustrates a first sensor **36** removably coupled to the first end **20** of base **12** and communicating therewith, a second sensor **36** removably coupled to the first sensor **36** proximate first end **20** and a third sensor **36** removably coupled to the second sensor **36** proximate first end **20**. Each of the sensors **36** is about 1" in length.

FIG. **7** depicts the sensor **36** having a housing **38** defining a first end **40** and a second end **42**. FIG. **7** depicts the sensor **36** having a cylinder like shape which minimizes "catching" on bag/contents, minimizing the risk of damage to the bag/contents, although other shapes are contemplated. Further housing **38** has an anti-slip exterior finish that resists scratches. It should be appreciated that the dimensions and exterior are illustrative only, and other sizes and dimensions are contemplated. Each sensor **36** has a first end **40** and second end **42** opposite the first end **40**, where the second end **42** is adapted to removably connect or couple to the base **12** or another sensor **36**. FIGS. **1-5** depict the second end **42** of the first sensor **36** is coupled to or proximate the first end **20**, the second end **42** of the second sensor **36** is coupled to the first end **40** of the first sensor **36** proximate end **20**, while the second end **42** of the third sensor **36** is coupled to the first end **40** of the second sensor **36**.

As depicted in FIG. **6**, each of the sensors **36** includes at least a rechargeable sensor power source **44** and a sensor controller **46** connected thereto. Each sensor power source **44** enables extended operation of the sensor **36** while the sensor controller **46** is configured for wireless communication to a wireless communication device such as a smartphone, PDA, laptop and the like.

In at least one embodiment, the one or more elements **14** comprise one or more sensors **36**. FIGS. **1-5** illustrate three sensors **36** coupled to the base **12** at or proximate first end **20**. While three sensors **36** are illustrated, more or less than three sensors **36** are contemplated. FIGS. **1-5** illustrates a first sensor **36** removably coupled to the first end **20** of base **12** and communicating therewith, a second sensor **36** removably coupled to the first sensor **36** proximate first end **20** and a third sensor **36** removably coupled to the second sensor **36** proximate first end **20**.

FIGS. **8**A-**8**F depict a mobile security system, generally designated **100**, in accordance with one embodiment of the present invention. In at least one embodiment, the mobile security system **100** operates in one or more modes. FIGS. **8**A-**8**E depicts the mobile security system **100** includes a mobile device **110** operating in a TRAVEL mode or proximity monitoring one or more proximity tags **160**. In this embodiment the mobile security system watches the user's bags and/or belongings to be sure they stay close.

FIGS. **8**A-**8**B depict the base **112** having a housing **116** defining a first end **120** and a second end **118**. FIG. **8**A-**8**B depicts the mobile security device **110** having an elongated, cylindrical-like shape which minimizes "catching" on bag/contents, minimizing the risk of damage to the bag/contents, although other shapes are contemplated. Further housing **116** has an anti-slip exterior finish that resists scratches. It should be appreciated that the dimensions and exterior are illustrative only, and other sizes and dimensions are contemplated.

Similar to the device **10** above, device **110** includes a base **112** having at least a rechargeable base power source **22** and a base controller **24** connected thereto. Base power source **22** enables extended operation of the base **112** and elements **114** while the base controller **24** is configured for wireless communication. FIGS. **8**A-**8**B further illustrate a speaker **126** coupled to at least one or both of the base power source **22** and the base controller **24**. The mobile security device **110** further includes a jack **128** proximate the first end **120**. Jack **128** is adapted to removably receive a USB charging cord to charge the base power source **22**.

In at least one embodiment, the base **112** further includes at least one camera **132** coupled to at least one of the base power source **22** and the base controller **24**. Further, the base **112** further includes at least one touch pad **134** communicating with at least the base controller **24**.

In at least one embodiment, the one or more elements **114** comprise one or more sensors **136**, the at least one or more sensors **136** configured to provide at least one of motion sensing, CO2/smoke sensing, vibration sensing, light sensing, temperature/humidity sensing and the like. FIGS. **8**A-**8**B illustrate three sensors **136** similar to the sensors described above coupled to the base **112** at or proximate first end **120**. While three sensors **136** are illustrated, more or less than three sensors **136** are contemplated. FIGS. **8**A-**8**B illustrates a first sensor **136** removably coupled to the first end **120** of base **112** and communicating therewith, a second sensor **136** removably coupled to the first sensor **136** proximate first end **120** and a third sensor **136** removably coupled to the second sensor **136** proximate first end **120**. Each of the sensors **136** is about 1" in length.

Additionally, the mobile security system **100** illustrated in FIGS. **8**A-**8**B includes a plurality of proximity tags **160** configured for removable attachment to a bag and/or belongings **170** (see FIG. **8**C) and communicating with the base **112**. While two proximity tags **160** are illustrated, more or less than two proximity tags **160** are contemplated. As depicted in FIG. **9** each of the proximity sensors **160** includes at least a proximity tag housing **162**, an on/off switch **164**, a proximity tag power source **166** and a proximity tag controller **168** connected thereto. Each proximity tag power source **166** enables extended operation of the proximity tag **160** when turned on or enabled using on/off switch **164** while the proximity tag controller **168** is configured for wireless communication with the base for example.

The at least one proximity tag **160** is configured for attachment to the bag or belongings **170** and communicating with the base **112** as illustrated in FIG. **8**C. The at least one proximity tag **160** is configured to provide approximate distance-from-base information. In operation, the at least one proximity tag **160** is independently powered-up moving the at least one on/off switch **164** (See FIG. **8**B). The at least one proximity tag **160** is placed on or concealed in the bag and/or belongings **170** as shown in FIG. **8**C. The system **100**

initiates proximity monitoring from the base **112**. The system **100** arms the base **110** and the at least one proximity tag **160** and monitors the at least one proximity tag **160** for proximity states. The system **100** enables base ALARMing and ALERTing when changes in proximity state of the at least one proximity tag **160** occur.

In at least one embodiment, the mobile security system **100** initiates proximity monitoring from the base **112** by powering up the base **112** and selecting proximity monitoring mode or TRAVEL mode from a plurality of modes using the at least one touch pad **134** communicating with at least the base controller **24**. In this embodiment, arming the base **112** and the at least one proximity tag **160** comprises the base **112** searching for, finding, and communicating with the at least one proximity tag **160**. Monitoring the at least one proximity tag **160** for proximity states (illustrated in FIGS. **8**D-**8**F) comprises monitoring the at least one proximity tag **160** in a passive interaction mode; detecting if the at least one proximity tag **160** enters an in-range state; detecting if the at least one proximity tag **160** enters an out-of-range state; detecting if the at least one proximity tag **160** enters an in-motion state; and rapid detection of change in a proximity state. System **100** enables base **112** ALARMing and ALERTing when changes in proximity state of the at least one proximity tag **160** occur which includes giving audio feedback via base speaker **126** (ALARMing) and the base **112** sending information about proximity state via SMS, e-mail, and/or other communication pathway (ALERTing) to a wireless communication device such as a smartphone, PDA, laptop and the like. The securing method of claim **21** wherein disarming the base **112** and the at least one proximity tag **160** includes powering down the base **112**; and physically detaching the at least one proximity tag **160** from the bag or belongings **170**.

FIGS. **10**A-**10**E depict a mobile security device, generally designated **210**, in accordance with one embodiment of the present invention. In at least one embodiment, the mobile security system **210** operates in one or more modes. FIGS. **10**A-**10**E depicts the mobile security device **210** operating in a one of a SURVAIL or SECURE mode.

FIGS. **10**A-**10**B depict the base **212** having a housing **216** defining a second end **218** and a first end **220**. FIG. **10**A-**10**B depict the mobile security device **210** having an elongated, cylindrical-like shape which minimizes "catching" on bag/contents, minimizing the risk of damage to the bag/contents, although other shapes are contemplated. Further housing **216** has an anti-slip exterior finish that resists scratches. It should be appreciated that the dimensions and exterior are illustrative only, and other sizes and dimensions are contemplated.

Similar to the device **10** above, device **210** includes a base **212** having at least a rechargeable base power source **22** and a base controller **24** connected thereto. Base power source **22** enables extended operation of the base **212** and elements **214** while the base controller **24** is configured for wireless communication. FIGS. **10**A-**10**B further illustrate a speaker **226** coupled to at least one or both of the base power source **22** and the base controller **24**. The mobile security device **210** further includes a jack **228** proximate the first end **220**. Jack **228** is adapted to removably receive a USB charging cord to charge the base power source **22**.

In at least one embodiment, the base **212** further includes at least one camera **232** coupled to at least one of the base power source **22** and the base controller **24**. Further, the base **212** further includes at least one touch pad **234** communicating with at least the base controller **24**.

In at least one embodiment, the one or more elements **214** comprise one or more sensors **236** configured to provide at least one of motion sensing, CO2/smoke sensing, vibration sensing, light sensing, temperature/humidity sensing, and the like. FIGS. **10**A-**10**B illustrate three sensors **236** similar to the sensors describe above coupled to the base **212** at or proximate second end **218**. While three sensors **236** are illustrated, more or less than three sensors **236** are contemplated. FIGS. **10**A-**10**B illustrates a first sensor **236** removably coupled to the first end **220** of base **212** and communicating therewith, a second sensor **236** removably coupled to the first sensor **236** proximate first end **220** and a third sensor **236** removably coupled to the second sensor **236** proximate first end **220**. Each of the sensors **236** is about 1" in length.

In at least one embodiment, the method for providing security using the mobile security device **210** includes the at least one sensor removably coupled to the first end of the base and communicating therewith, the at least one sensor configured to provide at least one of motion sensing, CO2/smoke sensing, vibration sensing, light sensing, and temperature/humidity sensing, the at least one sensor similar to any of the sensors discussed above. The method includes detaching the at least one sensor **236** auto-activating the sensor **236**. The at least one sensor **236** is positioned proximate at least one risk point in a security zone (See FIGS. **10**C-**10**E).

The method further includes initiating at least one of a watch-only and watch-and-warn sensor monitoring from the base **212**; arming the base **212** and the at least one sensor **236**; monitoring the at least sensor **236** for heartbeats; monitoring the at least sensor **236** for security events; performing at least one of base ALERTing, base ALARMing and base ALERTing and base ALARMing when missed heartbeats or security events occur in the at least one sensor **236**; and disarming the base **212** and the at least one sensor **236**.

The method further includes auto-activating the at least one sensor **236** which includes physically detaching the at least one sensor **236** from the base housing **216** (See FIG. **10**B) so that the sensor **236** automatically powers up and becomes receptive to communication from the base **212**. The at least one sensor **236** is positioned to at least one risk point in a security zone comprises placing the at least one sensor **236** in a location to detect changes in the local environment likely to represent a security issue related to at least one of windows, doors, light sources, water sources, fire sources, gas sources and the like (See FIGS. **10**C-**10**E).

The securing method includes initiating watch-only sensor monitoring from the base **212** comprises powering up the base **212** and selecting watching-only mode or SURVAIL mode from a plurality of modes using the at least one touch pad **234** communicating with at least the base controller **24**. In another embodiment, initiating watch-and-warn sensor monitoring from the base **212** comprises powering up the base **212** and selecting watching-and-warn mode or SECURE mode from a plurality of modes using the at least one touch pad **234** communicating with at least the base controller **24**. Arming the base **212** and the at least one sensor **236** include the base **212** searching for, finding, and communicating with the at least one sensor **236**.

In at least one embodiment, monitoring the at least one sensor **236** for heartbeats includes the at least one sensor **236** customizing the base's heartbeat interaction with the sensor **236**; the base **212** maintaining an active communication channel with the at least one sensor **236**; and the base **212**

periodically pinging the at least one sensor **236** and the at least one sensor **236** responding to the pinging over an active communication channel.

In another embodiment, monitoring the at least one sensor **236** for security events comprises the at least one sensor **236** monitoring for changes in local environment likely to represent a security issue; the at least one sensor **236** sending information about the security event in a standardized form to the base **212** via an active communication channel; and the base **212** receiving security event information in standardized form from the at least one sensor **236** via the active communication channel.

The securing method further includes base ALERTing when missed heartbeats or security events occur in the at least one sensor **236** includes the base **212** sending information about the at least one sensor's missed heartbeat or security event info via SMS, e-mail, and/or other communication pathway (ALERTing) to a wireless communication device such as a smartphone, cellphone, PDA, laptop and the like. Alternatively, the securing method includes base ALERTing when missed heartbeats or security events occur in the at least one sensor **236** comprises giving audio feedback via base speaker **226** (ALARMing) and the base **212** sending information about the at least one sensor's missed heartbeat or security event info via SMS, e-mail, and/or other communication pathway (ALERTing) to a wireless communication device such as a smartphone, cellphone, PDA, laptop and the like. Disarming the base **212** and the at least one sensor **236** comprises powering down the base **212**; and physically reattaching the at least one sensor **236** to the base housing **216** which results in auto-power-down of the at least one sensor **236**.

FIG. **11** illustrates another embodiment of the mobile security device **310** including a base **312** and multiple elements **314** comprising three sensors **336***a*, **336***b*, and **336***c*. The base **312** has a housing **316** defining a second end **318** and a first end **320**. The housing **316** has longitudinally extending anti-roll ridges **333**. The base **312** further includes a touch pad **334** similar to those described above. The base **312** also includes a UI select ring **335** and a speaker **326**.

The sensor **336***a*, shown in FIG. **12***a*, is coupled to the base **312** at the second end **320** of the base **312** and is configured to provide motion sensing. The sensor **336***a* includes a coin battery, a motion sensor, and a Bluetooth low-energy system-on-chip. The sensor **336***b*, shown in FIG. **12***b*, is coupled to the sensor **336***a* and is configured to provide camera functionality. The sensor **336***b* includes a Bluetooth low-energy system-on-chip, a camera battery, a still image camera, and an LED for illumination. The sensor **336***c* is coupled to the sensor **336***b* and is configured to provide carbon monoxide and smoke sensing. The sensor **336***c* includes a coin battery, a Bluetooth low-energy system-on-chip, a smoke sensor, and a carbon monoxide sensor.

While the embodiments of the invention disclosed herein are presently considered to be preferred, various changes and modifications can be made without departing from the spirit and scope of the invention. The scope of the invention is indicated in the appended claims, and all changes that come within the meaning and range of equivalents are intended to be embraced therein.

The invention claimed is:

1. A mobile security device comprising:

a handheld base comprising a housing, a base controller configured for wireless communication, and a base power source electrically connected to the base controller to power the base controller; and

a sensor module removably attachable to the housing of the base, the sensor module comprising:

a sensor;

a sensor module controller configured to wirelessly communicate with the base controller; and

a sensor module power source electrically connected to the sensor module controller to power the sensor module controller.

2. The mobile security device of claim **1**, wherein the base power source and the sensor module power source are rechargeable power sources.

3. The mobile security device of claim **1**, wherein the base further comprises an input device communicatively connected to the base controller and configured to enable selection of one of multiple different operating modes.

4. The mobile security device of claim **3**, wherein the input device comprises a touch panel.

5. The mobile security device of claim **1**, wherein the housing comprises a cylindrical base housing and the sensor module further comprises a cylindrical sensor module housing.

6. The mobile security device of claim **5**, wherein an outer diameter of the base housing is about the same as an outer diameter of the sensor module housing.

7. The mobile sec device of claim **1**, further comprising a second sensor module removably attachable to the sensor module, the second sensor module comprising:

a second sensor;

a second sensor module controller configured to wirelessly communicate with the base controller; and

a second sensor module power source electrically connected to the second sensor module controller to power the second sensor module controller,

wherein the sensor is a first type of sensor and the second sensor is a second type of sensor different from the first type of sensor.

8. The mobile security device of claim **1**, wherein the sensor includes one of: a motion sensor, a carbon monoxide sensor, a smoke sensor, a light sensor, a temperature sensor, and a humidity sensor.

9. The mobile security device of claim **1**, wherein the sensor module controller is configured to switch from a sensor module disarmed state to a sensor module armed state responsive to detachment of the sensor module from the base.

10. The mobile security device of claim **9**, wherein the base controller is configured to, responsive to detachment of the sensor module from the base, establish wireless communications with the sensor module controller.

11. The mobile security device of claim **10**, wherein the base controller is configured to switch from a base disarmed state to a base armed state responsive to detachment of the sensor module from the base.

12. The mobile security device of claim **9**, wherein the sensor module controller is configured to switch from the sensor module armed state to the sensor module disarmed state responsive to reattachment of the sensor module to the base.

13. The mobile security device of claim **9**, wherein the sensor module controller is configured to, when in the sensor module armed state:

monitor feedback received from the sensor;

determine whether a security event has occurred based on the feedback; and

responsive to determining that the security event has occurred, send security event occurrence information to the base controller.

14. The mobile security device of claim 13, wherein the base controller is configured to, responsive to receiving the security event occurrence information from the sensor module controller, cause a notification.

15. The mobile security device of claim 14, wherein the base further comprises a speaker communicatively connected to the base controller, and wherein the base controller is configured to cause the notification by causing the speaker to output a sound.

16. The mobile security device of claim 14, wherein the base controller is configured to cause the notification by wirelessly sending information associated with the security event to a mobile device.

17. The mobile security device of claim 16, further comprising a second sensor module removably attachable to the sensor module, the second sensor module comprising:

a second sensor, wherein the sensor is a first type of sensor and the second sensor is a second type of sensor different from the first type of sensor;

a second sensor module controller configured to wirelessly communicate with the base controller; and

a second sensor module power source electrically connected to the second sensor module controller to power the second sensor module controller,

wherein the second sensor module controller is configured to switch from a second sensor module disarmed state to a second sensor module armed state responsive to detachment of the second sensor module from the first sensor module.

18. The mobile security device of claim 17, wherein the second sensor module is removably attachable to the base.

19. The mobile security device of claim 17, wherein the base controller is configured to, responsive to detachment of the second sensor module from the sensor module, establish wireless communications with the second sensor module controller.

20. The mobile security device of claim 17, wherein the second sensor module controller is configured to switch from the second sensor module armed state to the second sensor module disarmed state responsive to reattachment of the second sensor module to the base.

21. The mobile security device of claim 17, wherein the second sensor module controller is configured to, when in the second sensor module armed state:

monitor feedback received from the second sensor;

determine whether a second security event has occurred based on the feedback; and

responsive to determining that the second security event has occurred, send second security event occurrence information to the base controller.

22. The mobile security device of claim 21, wherein base controller is configured to, responsive to receiving the second security event occurrence information from the second sensor module controller, cause a second notification.

23. The mobile security device of claim 22, wherein the base further comprises a speaker communicatively connected to the base controller, and wherein the base controller is configured to cause the second notification by causing the speaker to output a second sound.

24. The mobile security device of claim 22, wherein the base controller is configured to cause the second notification by wirelessly sending second information associated with the second security event to a mobile device.

25. The mobile security device of claim 22, wherein the base further comprises a speaker communicatively connected to the base controller,

wherein the base controller is operable in one of multiple different operating modes,

wherein when in a first one of the operating modes, the base controller is configured to cause the notification by causing the speaker to output a sound and to cause the second notification by causing the speaker to output a second sound, and

wherein when in a second one of the operating modes, the base controller is configured to cause the notification by sending information associated with the security event to a mobile device and to cause the second notification by sending second information associated with the security event to the mobile device.

26. The mobile security device of claim 14, wherein the base further comprises a speaker communicatively connected to the base controller,

wherein the base controller is operable in one of multiple different operating modes,

wherein when in a first one of the operating modes, the base controller is configured to cause the notification by causing the speaker to output a sound, and

wherein when in a second one of the operating modes, the base controller is configured to cause the notification by sending information associated with the security event to a mobile device.

27. A mobile security device comprising:

a handheld base comprising a base controller configured for wireless communication and a base power source electrically connected to the base controller to power the base controller;

a sensor module removably attachable to the base, the sensor module comprising:

a sensor;

a sensor module controller configured to wirelessly communicate with the base controller; and

a sensor module power source electrically connected to the sensor module controller to power the sensor module controller; and

a proximity tag comprising:

a proximity tag controller configured to wirelessly communicate with the base controller; and

a proximity tag power source electrically connected to the proximity tag controller to power the proximity tag controller,

wherein the base controller is configured to monitor the proximity tag for a change in proximity state and to cause a notification responsive to determining a proximity state change.

28. The mobile security device of claim 27, wherein the base controller is configured to cause the notification responsive to determining that the proximity tag changes to an out-of-range state.

29. The mobile security device of claim 27, wherein the base controller is configured to cause the notification responsive to determining that the proximity tag changes to an in-motion state.

30. The mobile security device of claim 27, wherein the proximity tag includes an input device operable to switch the proximity tag between on and off modes.

31. The mobile security device of claim 27, wherein the base further comprises a speaker communicatively connected to the base controller, and wherein the base controller is configured to cause the notification by causing the speaker to output a sound.

32. The mobile security device of claim 27, wherein the base controller is configured to cause the notification by sending information associated with the security event to a mobile device.

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